

Application No. 10/530,485
Reply to Office Action of May 15, 2007

IN THE DRAWINGS

The attached sheet of drawings includes new Figures 18 and 19.

Attachment: One New Sheet

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 18-34 are presently pending in this case. Claims 18-22, 24, 25, 31, 32, and 34 are amended by the present amendment. As amended Claims 18-22, 24, 25, 31, 32, and 34 are supported by the original claims, no new matter is added.

In the outstanding Official Action, the drawings were objected to; Claims 18-22, 24, 25, 31, and 32 were objected to; Claims 18, 19, 23, 24, 26, 27, and 31 were rejected under 35 U.S.C. §102(b) as anticipated by Dilger et al. (U.S. Patent No. 5,670,876, hereinafter “Dilger”); Claims 18, 20, 23-25, 31, and 32 were rejected under 35 U.S.C. §102(b) as anticipated by Hattori et al. (U.S. Patent No. 4,424,705, hereinafter “Hattori”); Claims 18, 21, and 33 were rejected under 35 U.S.C. §102(b) as anticipated by Carr et al. (U.S. Patent No. 4,745,363, hereinafter “Carr”); Claims 18, 21, and 28-30 were rejected under 35 U.S.C. §103(a) as patentable over Woyton (U.S. Patent No. 3,916,326) in view of Jansseune (U.S. Patent No. 6,043,646); and Claim 22 was rejected under 35 U.S.C. §103(a) as patentable over Carr in view of McDearmon et al. (U.S. Patent Application Publication No. 20040017190, hereinafter “McDearmon”). However, Claim 34 was objected to as dependent on a rejected base claim, but otherwise was indicated as including allowable subject matter if re-written in independent form.

Applicants gratefully acknowledge the indication that Claim 34 includes allowable subject matter.

The specification is amended herewith to include section headings and brief and detailed descriptions of new Figures 18 and 19. No new matter is added.

With regard the objection to the drawings, new Figures 18 and 19 included herewith illustrates subject matter of Claims 21 and 24. No new matter is added. With regard to claim

25, it is respectfully submitted that present Figure 17 illustrates this subject matter.

Accordingly, the objection to the drawings is believed to be overcome.

With regard to the objection to Claims 18-22, 24, 25, 31, and 32, Claims 18-22, 24, 25, 31, 32, and 34 are amended to replace "the magnet" with "the at least one magnet."

Accordingly, the objection to Claims 18-22, 24, 25, 31, and 32 is believed to be overcome.

With regard to the rejection of Claim 18 as anticipated by Dilger, that rejection is respectfully traversed.

Amended Claim 18 recites in part:

a target made of a ferromagnetic material;
at least one magnet, the target and the at least one magnet defining between one another an air gap;
a magnetosensitive element detecting a variation of induction caused in the air gap by displacement of the target relative to the at least one magnet, wherein the at least one magnet is magnetized along a direction substantially perpendicular to a front surface of the at least one magnet bounding one edge of the air gap, the at least one magnet having a cavity opening on the front surface of the at least one magnet, the magnetosensitive element being seated in the cavity, the target having a geometric configuration such that the variation of induction as a function of the position of the target corresponds to a predefined function.

Dilger describes a magnetic displacement sensor including two magnets 32 and 34 and a sensor 36.¹ The outstanding Office Action cited magnets 32 and 34 of Dilger as "at least one magnet" and sensor 36 of Dilger as "a magnetosensitive element."² However, it is respectfully submitted that Figure 5 of Dilger shows that neither of magnets 32 and 34 include any cavity opening, much less a cavity opening in which sensor 36 is seated. Further, the apparatus of Dilger needs both of magnets 32 and 34, as sensor 36 measures a single magnetic leakage between the two magnets. In this regard, the measure of induction is carried out perpendicular to the direction of the magnetization of the two magnets. Finally, it

¹See Dilger, Figures 1 and 2 and column 4, lines 29-56.

²See the outstanding Office Action at page 5, lines 9-13.

is respectfully submitted that Dilger does not describe a target having a geometric configuration such that the variation of induction as a function of the position of the target corresponds to a predefined function. Thus, it is respectfully submitted that Dilger does not teach “a target,” “at least one magnet,” and “a magnetosensitive element” as defined in amended Claim 18. Consequently, Claim 18 (and Claims 19-34 dependent therefrom) is not anticipated by Dilger and is patentable thereover.

With regard to the rejection of Claim 18 as anticipated by Hattori, that rejection is respectfully traversed.

Hattori describes an engine knock sensing apparatus including magnet 13 and coil 17.³ The outstanding Office Action cited magnet 13 of Hattori as “at least one magnet” and coil 17 of Hattori as “a magnetosensitive element.”⁴ However, it is respectfully submitted that coil 17 is not a Hall type sensor like applicant’s transducer. In this regard, coil 17 does not present a true power on function, such that without movement of the target, there is no induction, which is read by the coil. Therefore, there must be movement of the target to be able to read the position of the target. In applicant’s transducer, the Hall sensor can continuously read, with or without the movement, the generated induction by the magnets and thus know the position of the target. Further, the apparatus of Hattori includes ferromagnetic elements (14, 15 and 16 in Figure 4, 16 and 24 in Figure 5), which help the flux of the magnet to be channeled. Without these ferromagnetic elements, which are indispensable to the invention of Hattori, it is not possible to obtain a responsive induction variation. Claim 18 does not recite such elements. Finally, the principle of the coil 17 is to observe the resulting pressure resulting from movement of the target, which means that there is no way of carrying out a controlled variation of induction thanks to the function of the target. Thus, it is respectfully submitted that Hattori does not teach “a target,” “at least one

³See Hattori, Figure 4 and column 4, lines 3-15.

⁴See the outstanding Office Action at page 7, lines 7-11.

magnet,” and “a magnetosensitive element” as defined in amended Claim 18. Consequently, Claim 18 (and Claims 19-34 dependent therefrom) is not anticipated by Hattori and is patentable thereover.

With regard to the rejection of Claim 18 as anticipated by Carr, that rejection is respectfully traversed.

Carr describes a magnetic displacement sensor including magnet 10 and a Hall integrated circuit 14.⁵ The outstanding Office Action cited magnet 10 of Carr as “at least one magnet” and Hall integrated circuit 14 of Carr as “a magnetosensitive element.”⁶ However, it is respectfully submitted that Hall integrated circuit 14 is not an analog sensor, but a digital sensor. As gear teeth 16, 18, and 20 rotate past the Hall cell in circuit 14, the flux perpendicular to the face or plane of the Hall cell is zero when a tooth is directly balanced below the Hall cell and the flux concentrators 12. As a given tooth is displaced to one side or the other, the flux is steered through one of the concentrators 12 to produce a component perpendicular to the Hall cell, causing a complete flux reversal with each passing gear tooth. Thus, the functions and the usage of these two types of sensors are therefore very different. As result, there is not a continuous variation of induction in the Hall integrated circuit 14. Finally, the Hall integrated circuit 14 of Carr is positioned perpendicularly to the magnet 10. Thus, it is respectfully submitted that Carr does not teach “a target,” “at least one magnet,” and “a magnetosensitive element” as defined in amended Claim 18. Consequently, Claim 18 (and Claims 19-34 dependent therefrom) is not anticipated by Carr and is patentable thereover.

With regard to the rejection of Claim 18 as unpatentable over Woyton in view of Jansseune, that rejection is respectfully traversed.

⁵See Carr, Figure 1 and column 3, lines 31-39.

⁶See the outstanding Office Action at page 5, lines 9-13.

Woyton describes a sensing circuit including coil 16.⁷ Jansseune describes a proximity switch including magnet 10 and sensor 12.⁸ The outstanding Office Action apparently cited magnet 10 of Jansseune as “at least one magnet” and sensor 12 of Jansseune as “a magnetosensitive element.”⁹ However, it is respectfully submitted that Woyton does not describe a magnet, nor has any part of Woyton been cited as such. Instead, Woyton seems to describe a coil 16 which reads the difference in the electric response of gear teeth and thus determines when the gear teeth pass. It is respectfully submitted that Woyton does not teach or suggest that the tooth profile is predetermined and therefore obtains a linear output signal. In combination with Jansseune, which simply presents a similar magnet 10 and a sensor 12 to those of Woyton, it is respectfully submitted that one of ordinary skill in the art would only be able to obtain a sensor in which the variation of the signal would not be linear. Thus, it is respectfully submitted that none of Woyton, Jansseune, or a combination of the two teaches or suggests “a target,” “at least one magnet,” and “a magnetosensitive element” as defined in amended Claim 18. Consequently, Claim 18 (and Claims 19-34 dependent therefrom) is patentable over Woyton and Jansseune.

With regard to the rejection of Claim 22 as unpatentable over Carr in view of McDearmon, it is noted that Claim 22 is dependent from Claim 18, and thus is believed to be patentable for at least the reasons discussed above. Further, it is respectfully submitted that McDearmon does not cure any of the above-noted deficiencies of Carr. Accordingly, it is respectfully submitted that Claim 22 is patentable over Carr in view of McDearmon.

⁷See Woyton, Figure 2 and column 3, lines 31-49.

⁸See Jansseune, Figure 1 and column 2, lines 2-10.

⁹See the outstanding Office Action at page 11, lines 1-10.

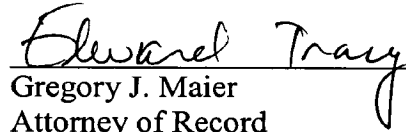
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Accordingly, the pending claims are believed to be in condition for formal allowance.

An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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